

# Notice No.2

## Rules for the Manufacture, Testing and Certification of Materials July 2016

The status of this Rule set is amended as shown and is now to be read in conjunction with this and prior Notices. Any corrigenda included in the Notice are effective immediately.

Issue date: December 2016

Amendments to	Effective date	Mandatory Instrument
Chapter 3, Sections 3 & 8	1 January 2017	
Chapter 5, Section 3	1 January 2017	X

## Chapter 3

### Rolled Steel Plates, Strip, Sections and Bars

#### ■ Section 3

#### Higher strength steels for ship and other structural applications

##### 3.4 Chemical composition

3.4.1 The chemical compositions of ladle samples for all grades of steel are to comply with the requirements of the approved manufacturing specification and the limits given in Table 3.3.2 Chemical composition. The requirements for H47 strength grade steels are given in Table 3.3.3 Chemical composition for Grade EH 47.

**Table 3.3.3 Chemical composition for Grade EH 47**

Chemical element	max. (%)
Carbon	0,20
Manganese	2,00
Silicon	0,55
Phosphorus	0,030
Sulphur	0,030
Nickel	2,00
Chromium	0,25
Molybdenum	0,08
Grain refining elements (see Note 1)	0,015 min. (see Note 2) See Note 1
Aluminium (acid soluble)	
Residual elements Copper	0,35
<b>Note 1.</b> The grain refining elements niobium, vanadium and titanium are to be in accordance with the approved specification. The steel is to contain aluminium, niobium, vanadium, titanium, or other suitable grain refining elements, either singly or in any combination, in accordance with the approved specification. <b>Note 2.</b> The total aluminium content may be determined instead of the acid soluble content. In these cases, the total aluminium content is to be not less than 0,020%.	

#### ■ Section 8

#### Plates with specified through thickness properties

##### 8.5 Non-destructive examination

8.5.1 All 'Z' grade plates are to be ultrasonically tested in the final supply condition with a probe frequency of 3-5 MHz. The testing is to be performed in accordance with and in compliance with either EN 10160 Level S1/E1 or ASTM A 578 Level C.

## Chapter 5 Steel Forgings

### ■ Section 3 Forgings for shafting and machinery

#### 3.1 Scope

3.1.2 Where it is proposed to use alloy steel forgings, particulars of the chemical composition, mechanical properties and heat treatment are to be submitted for approval. ~~For main propulsion shafting in alloy steels, the specified minimum tensile strength is not to exceed 800 N/mm<sup>2</sup> (800–950 N/mm<sup>2</sup> acceptance range) and for other forgings is not to exceed 1100 N/mm<sup>2</sup> (1100–1300 N/mm<sup>2</sup> acceptance range).~~

#### 3.4 Mechanical tests

3.4.6 Forgings may be supplied to any specified minimum tensile strength selected within the general limits detailed in *Table 5.3.1 Mechanical properties for acceptance purposes: carbon and carbon-manganese steel forgings for machinery and shafting*, except that for main propulsion shafting forgings the specified minimum tensile strength is to be ~~not less than 400 N/mm<sup>2</sup> (400–520 N/mm<sup>2</sup> acceptance range) and not greater than 600 N/mm<sup>2</sup> (600–750 N/mm<sup>2</sup> acceptance range) see *Table 5.3.1 Mechanical properties for acceptance purposes: carbon and carbon-manganese steel forgings for machinery and shafting*~~ as defined in the relevant Rules dealing with design.

**Table 5.3.1 Mechanical properties for acceptance purposes: carbon and carbon-manganese steel forgings for machinery and shafting**

Tensile strength N/mm <sup>2</sup> (See Note 1)	Yield stress N/mm <sup>2</sup>	Elongation on 5,65 $\sqrt{S_0}$ min %		Reduction of area min. %	
		Long- Longitudinal	Tang- Tangential	Long- Longitudinal	Tang- Tangential
360 – 480	180	28	20	50	35
400 – 520	200	26	19	50	35
440 – 560	220	24	18	50	35
470 – 590	235	23	17	45	35
480 – 600	240	22	16	45	30
520 – 640	260	21	15	45	30
560 – 680	280	20	14	40	27
600 – 750	300	18	13	40	27
640 – 790	320	17	12	40	27
680 – 830	340	16	12	35	24
700 – 850	350	15	11	35	24
720 – 870	360	15	11	35	24
760 – 910	380	14	10	35	24

**Note 1.** For main propulsion shafting forgings, the specified minimum tensile strength is to be between 400 and 600 N/mm<sup>2</sup> see *Ch 5, 3.4 Mechanical tests 3.4.6* as defined in the relevant Rules dealing with design.

**Note 2.** Where the specified minimum tensile strength exceeds 700 N/mm<sup>2</sup>, forgings are to be supplied only in the quenched and tempered condition.

**Table 5.3.2 Mechanical properties for acceptance purposes: alloy steel forgings for machinery and shafting**

Tensile strength N/mm <sup>2</sup> (See Note)	Yield stress N/mm <sup>2</sup>	Elongation on 5,65 $\sqrt{S_0}$ min %		Reduction of area min. %	
		Long: Longitudinal	Tang: Tangential	Long: Longitudinal	Tang: Tangential
600 – 750	420	18	14	50	35
650 – 800 <i>See</i>	450	17	13	50	35
700 – 850 <i>Note</i>	480	16	12	45	30
750 – 900	530	15	11	45	30
800 – 950	580	14	10	40	27
850 – 1000	630	13	9	40	27
900 – 1100	690	13	9	40	27
950 – 1150	750	12	8	35	24
1000 – 1200	810	12	8	35	24
1050 – 1250	870	11	7	35	24
1100 – 1300	930	11	7	35	24

**Note** For main propulsion shafting forgings, the minimum specified tensile strength is not to exceed 800 N/mm<sup>2</sup> see Ch 5, 3.4 Mechanical tests 3.4.9 to be as defined in the relevant Rules dealing with design. For other forgings the minimum specified tensile strength is not to exceed 1100 N/mm<sup>2</sup> (1100–1300 N/mm<sup>2</sup> acceptance range).

3.4.9 Forgings in alloy steels may be supplied to any specified minimum tensile strength selected within the general limits detailed in *Table 5.3.2 Mechanical properties for acceptance purposes: alloy steel forgings for machinery and shafting*, and minimum yield stress, elongation and reduction of area, obtained by interpolation, except that for main propulsion shafting forgings the specified minimum tensile strength is not to exceed 800 N/mm<sup>2</sup> (800-950 N/mm<sup>2</sup> acceptance range) see shaded area of *Table 5.3.2 Mechanical properties for acceptance purposes: alloy steel forgings for machinery and shafting*. to be as defined in the relevant Rules dealing with design.

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